CLAIMS

1. A method of racemizing N-carbamoyl amino acids, comprising:

contacting an N-carbamoyl amino acid with an effective amount of an N-acetyl amino acid racemase (AAR) from Amycolatopsis orientalis subspecies lurida.

2. The method of Claim 1, which is conducted in an enzyme-membrane reactor.

3. The method of Claim 1, wherein the N-acetyl amino acid racemase has the amino acid sequence shown in SEQ ID NO: 2.

4. The method of Claim 1, wherein the N-carbamoyl amino acid is an N-carbamoyl α-amino acid.

5. The method of Claim 1, wherein the amino acid is a natural amino acid.

6. The method of Claim 1, wherein the amino acid is an unnatural amino acid.

7. The method of Claim 1, further comprising treating the racemized N-carbamoyl amino acid with a carbamoylase.

8. A method of producing enantiomerically enriched amino acids, comprising:

contacting an N-carbamoyl amino acid with an effective amount of an N-acetyl amino acid racemase (AAR) from Amycolatopsis orientalis subspecies lurida, and

contacting the racemized N-carbamoyl amino acid with a carbamoylase.

9. The method of Claim 8, which is conducted in an enzyme-membrane reactor.

10. The method of Claim 8, wherein the N-acetyl amino acid racemase has the amino acid sequence shown in SEQ ID NO: 2.

11. The method of Claim 8, wherein the N-carbamoyl amino acid is an N-carbamoyl α-amino acid.

12. The method of Claim 8, wherein the amino acid is a natural amino acid.

13. The method of Claim 8, wherein the amino acid is an unnatural amino acid.

14. A method of producing enantiomerically enriched amino acids, comprising:

contacting an a hydantoin with a hydantoinase to produce the corresponding N-carbamoyl amino acid,

contacting an N-carbamoyl amino acid with an effective amount of an N-acetyl amino acid racemase (AAR) from Amycolatopsis orientalis subspecies lurida to produce a racemized N-carbamoyl amino acid, and

contacting the racemized N-carbamoyl amino acid with a carbamoylase to produce the corresponding amino acid.

15. The method of Claim 14, which is conducted in an enzyme-membrane reactor.

16. The method of Claim 14, wherein the N-acetyl amino acid racemase has the amino acid sequence shown in SEQ ID NO: 2.

17. The method of Claim 14, wherein the N-carbamoyl amino acid is an N-carbamoyl α-amino acid.

18. The method of Claim 14, wherein the amino acid is a natural amino acid.

19. The method of Claim 14, wherein the amino acid is an unnatural amino acid.